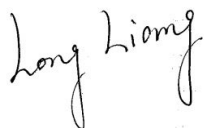


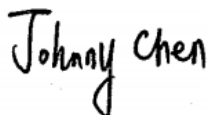
RF Exposure Evaluation Report

APPLICANT : Lantronix, Inc.
EQUIPMENT : GNSS / GSM / UMTS / BLE - Device
BRAND NAME : Lantronix
MODEL NAME : FOX3-3G-BLE
FCC ID : R68FOX3-3G-BLE
STANDARD : 47 CFR Part 2.1091
FCC KDB 447498 D01 v06

We, Sporton International (ShenZhen) Inc., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International (ShenZhen) Inc., the test report shall not be reproduced except in full.



Reviewed by: Long Liang / Supervisor



Approved by: Johnny Chen / Manager



Sporton International (ShenZhen) Inc.

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055

People's Republic of China



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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA890508	Rev. 01	Initial issue of report	Sep. 30, 2019



1. Administration Data

1.1. Testing Laboratory

Sporton International (Shenzhen) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory		
Test Firm	Sporton International (Shenzhen) Inc.	
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595	
Test Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CN1256	421272

Applicant	
Company Name	Lantronix, Inc.
Address	7535 Irvine Center Drive, Suite 100, Irvine, CA 92618 , USA

Manufacturer	
Company Name	Lantronix, Inc.
Address	7535 Irvine Center Drive, Suite 100, Irvine, CA 92618 , USA

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	GNSS / GSM / UMTS / BLE - Device
Brand Name	Lantronix
Model Name	FOX3-3G-BLE
FCC ID	R68FOX3
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz Bluetooth: 2402MHz~2480MHz
Mode	GPRS/EGPRS RMC 12.2Kbps HSDPA HSUPA Bluetooth LE
HW Version	P281_Rev03c
SW Version	3.1.0
EUT Stage	Identical Prototype
Remark: 1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description. 2. It supports GPRS/EGPRS class 12.	

3. Maximum RF average output power among production units

<GSM >

Mode	Burst average power(dBm)	
	GSM 850	GSM 1900
GPRS (GMSK, 1 Tx slot)	33.50	30.50
GPRS (GMSK, 2 Tx slots)	33.50	30.50
GPRS (GMSK, 3 Tx slots)	32.50	29.50
GPRS (GMSK, 4 Tx slots)	31.50	28.50
EDGE (8PSK, 1 Tx slot)	27.50	26.50
EDGE (8PSK, 2 Tx slots)	27.50	26.50
EDGE (8PSK, 3 Tx slots)	27.00	25.50
EDGE (8PSK, 4 Tx slots)	25.50	24.50

<WCDMA>

Mode		Maximum Average power(dBm)
WCDMA	Band II	23.50
	Band V	23.50

<Bluetooth >

Band / Mode	Average Power (dBm)	
	LE	
	GFSK	
Bluetooth	-5.00	

4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation for WWAN module

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
GPRS 850 (1 Tx slot)	824.2	2.00	33.50	35.500	446.684	0.089	0.549	0.162
GPRS 850 (2 Tx slots)	824.2	2.00	33.50	35.500	891.251	0.177	0.549	0.323
GPRS 850 (3 Tx slots)	824.2	2.00	32.50	34.500	1056.818	0.210	0.549	0.383
GPRS 850 (4 Tx slots)	824.2	2.00	31.50	33.500	1122.018	0.223	0.549	0.406
EGPRS 850 (1 Tx slot)	824.2	2.00	27.50	29.500	112.202	0.022	0.549	0.041
EGPRS 850 (2 Tx slots)	824.2	2.00	27.50	29.500	223.872	0.045	0.549	0.081
EGPRS 850 (3 Tx slots)	824.2	2.00	27.00	29.000	297.852	0.059	0.549	0.108
EGPRS 850 (4 Tx slots)	824.2	2.00	25.50	27.500	281.838	0.056	0.549	0.102
GPRS 1900 (1 Tx slot)	1850.2	2.00	30.50	32.500	223.872	0.045	1.000	0.045
GPRS 1900 (2 Tx slots)	1850.2	2.00	30.50	32.500	446.684	0.089	1.000	0.089
GPRS 1900 (3 Tx slots)	1850.2	2.00	29.50	31.500	529.663	0.105	1.000	0.105
GPRS 1900 (4 Tx slots)	1850.2	2.00	28.50	30.500	562.341	0.112	1.000	0.112
EGPRS 1900 (1 Tx slot)	1850.2	2.00	26.50	28.500	89.125	0.018	1.000	0.018
EGPRS 1900 (2 Tx slots)	1850.2	2.00	26.50	28.500	177.828	0.035	1.000	0.035
EGPRS 1900 (3 Tx slots)	1850.2	2.00	25.50	27.500	210.863	0.042	1.000	0.042
EGPRS 1900 (4 Tx slots)	1850.2	2.00	24.50	26.500	223.872	0.045	1.000	0.045
WCDMA Band II	1852.4	2.00	23.50	25.500	354.813	0.071	1.000	0.071
WCDMA Band V	826.4	2.00	23.50	25.500	354.813	0.071	0.551	0.128
Bluetooth LE	2402	2.00	-5.00	-3.000	0.501	0.0001	1.000	0.0001

Note:

1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band
2. Chose the maximum power density to do MPE analysis.

**5.2. Collocated Power Density Calculation**

WWAN Power Density / Limit	Bluetooth Power Density / Limit	Σ (Power Density / Limit) of WWAN+Bluetooth
0.406	0.0001	0.4061

Note:

1. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + Bluetooth.
2. Considering the WWAN module collocation with the Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1.

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.